


CCEC SCEC CTED DCDT CCCBD CCLD  
IDA-RMB CSSP CSHA LDAC CDE

Jan. 15 & 16, 2010 Colorado Springs

*A Collaborative Conference  
for Special Education*

**COURAGE  
to RISK**



**Understanding  
Academic  
Texts**

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**“Nearly half of incoming freshmen  
cannot read their textbooks fluently”**

(Carnegie Corporation, 2002)

**but...**

“Morphological knowledge is a wonderful dimension of the child’s uncovering of “what’s in a word,” and one of the least exploited aids to fluent comprehension”  
(Wolfe, 2007, p. 130)

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**Teach Vocabulary**  
**An Effective Use of Instructional Time**


**Time—measured in just minutes—  
spent on vocabulary instruction  
correlates with growth in reading  
comprehension**

- Stahl & Fairbanks, 1986 (a meta-analysis of vocabulary studies at varying grade levels)

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**Thesis: Persistence**  
**Vocabulary is a Growth Construct**



Slowly the bucket fills,  
through many encounters  
with the word or morpheme  
in varying context over time  
(the pace accelerates  
through instruction)

**Invest Time in Academic Vocabulary**

- Is the word frequently used across subject areas?  
– *plot, positive, revolution*
- Is it widely related (large root family)?  
– *civil, villian, civility, uncivil, civilize, civilization, etc.*

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Poor comprehension outcomes in middle school are frequently due to limited vocabulary, including knowledge of academic words

(e.g., August & Shanahan, 2006; Buly & Valencia, 2003; Carlo, 2005; Stahl & Nagy, 2006; Stanovich, 1986)

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### Word Knowledge ➡ Comprehension

Reading with comprehension depends on understanding at least 95% of the words

(Carver, 1994; Hu & Nation, 2000)

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### Interest Wanes if Text is Incomprehensible



Interest is more likely to engage if the task is appraised as challenging but not too difficult, within reach but not a cakewalk. Instruction offsets the negative influence of low self-efficacy

(Hidi & Ainley, 2008; Silvia, 2003; Willingham, 2009)

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### We Cannot Rely on Context

- Nagy, Anderson, and Herman (1987) estimated a probability of only 5%
- Nagy, Herman, and Anderson (1985) found an 11% probability

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### We Cannot Rely on Educational Videos

- Educational media may help students develop interest in a given topic
- But they have little effect on knowledge structures, vocabulary, and comprehension of related texts
- (Adams, 2009; Bus, de Jong, & Verhallen, 2008; Echols, West, Stanovich, & Zehr, 1996)

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### Three Global Suggestions

- Enjoy Words & Morphemes
  - overcome apathy
  - not a right/wrong proposition
  - build knowledge & interest
- Verbalize Words & Concepts
  - enunciate, discuss, debate
- Relate Words, Connect Concepts
  - build networks
  - form associations



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### Four Specific Suggestions

- Build topic knowledge, interest (Adams, 2009)
- Verbally, substitute known words with academic words
- Promote morphological awareness
- Teach and review word meanings with persistence

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### Topic Knowledge ~ Topic Vocabulary

**Build knowledge around a given topic—the associated words will tag along (see Adams, 2009).**

**Bonus:** Knowledge triggers interest. Interest prompts persistence and promotes deeper processing

(Ainley et al., 2002; Kintsch, 1998; Thorndike, 1906).

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### Optimize Oral Language

- **Provide adolescents with instruction that includes discussion of text and concepts** (Torgesen et al., 2007)
- **Oral discussion of content and content vocabulary is a common component of many successful reading interventions** (Nagy, 2007)

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### Ways to Improve Adolescent Literacy

Source: Florida Center for Reading Research; Torgesen, August 2006

1. More explicit instruction and guided practice in the use of reading comprehension strategies
2. Increasing the amount of discussion of content in texts
3. Maintain high standards for the level of conversation, questions, vocabulary used in discussions and assignments
4. Adopt instructional methods that increase student engagement with text and motivate students to read
5. Teach content material in powerfully explicit and cognitively engaging ways, providing review over time

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### Words for Academic Success

- Academic words
- Used primarily in school texts or other formal settings
  - Students from disadvantaged backgrounds are less likely to hear this language at home
    - low SES
    - non-English (or non standard English speaking)
    - less exposure to those with post-secondary education

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School of Linguistics & Applied Language Studies  
**THE ACADEMIC WORD LIST**

Averil Coxhead

*Sublist 1 of the Academic Word List - Most Frequent Words in Families*

[www.victoria.ac.nz/lals/staff/averil-coxhead/awl/](http://www.victoria.ac.nz/lals/staff/averil-coxhead/awl/)

<p><i>analysis</i></p> <p><i>approach</i></p> <p><i>area</i></p> <p><i>assessment</i></p> <p><i>assume</i></p> <p><i>authority</i></p> <p><i>available</i></p> <p><i>benefit</i></p> <p><i>concept</i></p> <p><i>consistent</i></p> <p><i>constitutional</i></p> <p><i>context</i></p> <p><i>contract</i></p>	<p><i>method</i></p> <p><i>occur</i></p> <p><i>percent</i></p> <p><i>period</i></p> <p><i>policy</i></p> <p><i>principle</i></p> <p><i>procedure</i></p> <p><i>process</i></p> <p><i>required</i></p> <p><i>research</i></p> <p><i>response</i></p> <p><i>role</i></p> <p>©: <i>section</i></p>
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note the "task words" (words used in directions)

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### Word-Savvy Students

#### Tuned in, Turned on, and Word Conscious!

**"...vocabulary instruction needs to be more explicitly metalinguistic—that is, word consciousness is an obligatory, not an optional, component"**

Nagy, 2007, p. 54

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### Word-Savvy Students Are Morphologically Aware

**Morphological Awareness (MA)**

- The ability and aptitude to use knowledge of prefixes, suffixes, roots, and bases to gain word knowledge
- Also called structural analysis

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The greatest benefit from instructional time spent on word study can be gained from exploring roots, prefixes, suffixes, and networks of related words.

--Henry, 1997

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### Morphology Terminology

**Morpheme:** The smallest unit of meaning in a word  
*unlocking* has 3 morphemes: un-lock-ing  
*biographers* has 4 morphemes: bio-graph-er-s

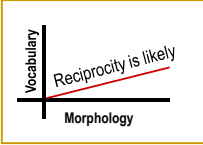
**Common Morphemes:**

word root: *inspector*, *phonics*  
 base word: *unlikely* *light* *house*  
 prefix: *re-*, *un-*, *dis-*  
 suffix: *-able*, *-ive*, *-ly* } **affixes**

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### MA Increasingly Influences Word Knowledge

- **When controlling for:**
  - age, word identification, phonological processing, etc.
  - MA accounts for vocabulary variance among students in:
    - Kindergarten: 8%
    - 2<sup>nd</sup> grade: 15%
      - McBride-Chang et al., 2005
    - 5<sup>th</sup> grade: 50% (didn't control for PA)
      - Carlisle, 2000



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### MA & Reading

- By fifth grade, MA predicts reading better than PA
  - Mann and Singson, 2003
- MA made a significant and unique contribution to reading comprehension in grades 4-9
  - Nagy, Berninger, & Abbott, 2006

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### Word-Savvy Students Grasp Derivations

<b>base words</b>	<b>boy, farm, cold</b>
<b>inflections</b>	<b>boys, farmed, farming, colder, coldest</b>
<b>compound words</b>	<b>boyfriend, farmhouse, coldhearted</b>
<b>derivations</b> syntax shift	<b>boyish, boyishly, boyhood, farmer, Farmington, farmstead</b>

(Anglin, 1993; Berko, 1958; Gardner, 2007; Tyler & Nagy, 1989; Wysocki & Jenkins, 1987)

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### Those Dratted Derivations!


**Which Transformations Are More Complex?**

- no shift in orthography or phonology  
– (e.g., growth to grow; childish to child; computer to compute)
- orthographic shift but no phonological shift  
– (e.g., famous to fame; creative to create)
- phonological shift but no orthographic shift  
– (e.g., courageous to courage; adaptation to adapt)
- both a phonological and an orthographic shift  
– (e.g., width to wide; health to heal; computation to compute)


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### The Wug Test

Jean Berko-Gleason, 1958  
12 graduate students  
86 children  
preschool and 1<sup>st</sup> grade



This is a wug.



Now there is another one.  
There are two of them.  
There are two \_\_\_\_\_.

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### Research with Compounds and Related Words



At-risk second-grade readers failed to understand the meanings of compound words and did not recognize related word (e.g., *quick*, *quickly*, *quicksand*, *quicken*)  
(Nagy, Berninger, Abbott, Vaughan, & Vermeulen, 2003; see also Juhasz, Starr, Inhoff, & Placke, 2003)

What would you call grass where bees like to hide?  
*beegrass* or *grassbee*?

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### Anglin, 1993

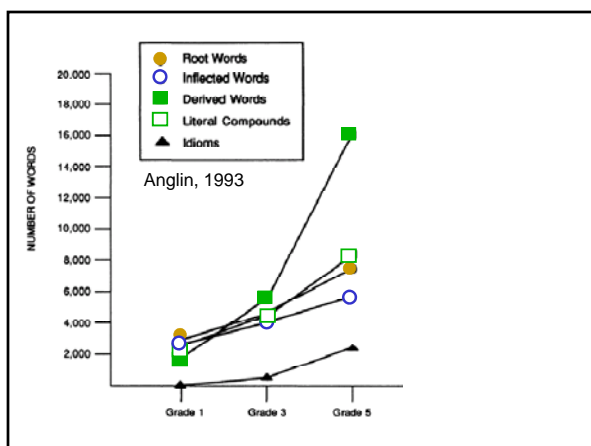
Interview with fifth grader, verbal, no pictures (p. 100)

What does the word **treelet** mean?  
*OK. Maybe it means like a tree and maybe like for Christmas you can put lights on it...*

Can you tell me anything more about treelet?  
*Is it spelled -let or -lit?*

Actually, it's l-e-t.  
*I'm not sure about this, but it might mean a baby tree...*

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### Butler et al. (2004) Describe Academic Words in 5<sup>th</sup> Grade Math, Science, and Social Studies

- Low frequency words, rare words  
    <11 exposures per million words  
    (as per Zeno et al., 1995)
- Words with ≥ 3 syllables
- Derivations  
    – with syntax-driving suffix (e.g., -ly, -ism, -ize)
- Nominalizations (often ending with -tion)  
    – a noun that represents a process of actions

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### Troublesome Derivations: The Best Indicator of Academic Text And Most Ubiquitous to Science

Butler et al., 2004, p. 48 (a 5<sup>th</sup> grade text analysis)

Table 13

Proportion of Low Frequency Word, 3-or-More-Syllable-Word, and Derived Word Types Identified as Academic Word Types by Subject

Subject	Low freq.	3-or-more-syllables	Derived
Math	.20	.34	.33
Science	.61	.52	.81
Social Studies	.58	.54	.64

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### Word-Savvy Students Recognize Morphological Families

Upper elementary students generally read words more quickly and accurately if they belonged to large morphological families (e.g., *tract, tractor, traction, subtract, retract, detract, extract, protractor*)

–facilitated by semantic and phonological transparency and by reading proficiency

(Carlisle and Katz; 2006; see also Bertram, Baayen, & Schreuder, 2000; Nagy, Anderson, Schommer, Scott, & Stallman, 1989)

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### Networking a Morphological Family

sign	signal	signal light	cosign
signify	signature	significant	insignificant
signage	insignia	signpost	signet ring
sign in	sign off	sign up	sign language
signs of the times		give me a sign	

**sign: from Latin *signum*, meaning “to mark, to show”**

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grammar school  
grammar books  
rules of grammar  
grammatical  
grammatically  
ungrammatical  
ungrammatically  
grammatology

**gram, graph  
to write,  
written**  
Greek

photograph  
polygraph  
mimeograph  
phonograph  
telegraph  
paragraph

grammar

graph

telegram  
mammogram  
histogram  
anagram  
cryptogram  
monogram  
electrocardiogram

gram

graphite  
grapheme  
graphologist  
graphic  
graphically

photographer  
cartographer  
geographer  
cryptographer  
autobiographer  
xylographer  
paleographer  
biographer

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lemon drop  
gum drop  
teardrop

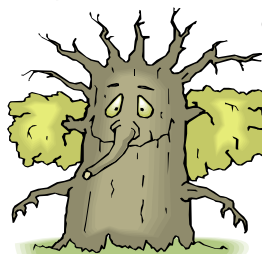
eye dropper  
eye droppers

dropper

droplet  
droplets

dropkick

drop  
drops  
dropping  
dropped



“drop in” for a visit

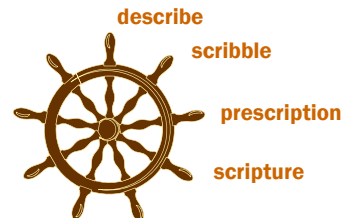
just “drop by”

**drop**

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### Networks, Webs, Diagrams

Create networks of related words. Make a word wheel for the Latin root script or scrib, meaning *to write*.



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### Word-Savvy Students Form Networks Through Morphological Families

#### *terra* (Latin for 'earth')

- territory
- Mediterranean Sea
- terracotta pots, terracotta tiles
- extraterrestrial exploration
- rough terrain
- subterranean excavation
- territorial or possessive behaviors
- *terra firma*
- *Tara* ?? (*Gone with the Wind*)

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### Linking the Curriculum Via Morphological Families

#### *astro*: Greek for stars, heavens

aster (flower)  
asterisk  
astronomer  
astrology  
astrobiology  
astrophysics  
**disaster ???**

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### Word-Savvy Students are Fearless

Including such [morphological] ideas in discussions of words lets students see language as an open book rather than as mysterious and impenetrable with authority over them...

Beck, McKeown, & Kucan, 2002, p. 128

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### Word-Savvy Students Master Morphologically Complex Words

About 60% of the word meanings in printed school English in grades 3-9 might be inferred through knowledge of their morphemes (along with context clues)

(Nagy & Anderson, 1984)

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### Word-Savvy Students are Strategists

**context + morphemes = meaning**

**This student feels confident and capable  
when confronted by unknown vocabulary.**

**I think I can, I think I can...**

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### Morphemic Analysis in Context

(source: Mountain, 2005)

Here's a new word in our story: **tripod**. It says, "He put the camera on the tripod." I wonder what a tripod could be?

Let's say the word again, syllable by syllable,  
and look for a meaningful part: *tri-pod*

Have you heard *tri* before—in *triangle*, *tricycle*, *triceratops*?

How many sides on a triangle? *Three.*

How many wheels on a tricycle? *Three.*


How many horns on the dinosaur triceratops? *Three.*

Do you think a tripod might have **three** of something? Three what?

What does the story say about the tripod?

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When a hot-air or gas balloon surged aloft it could only float where the wind blew it. By rising or sinking the balloon, the pilot looked for a certain kind of wind. When the pilot found that wind, it was smooth sailing ahead!

Source: Virginia Arnold *Another Way to Fly*

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### Outside-In Strategy

1. Look **outside** the word at context clues.
2. Look **inside** the word for meaningful word parts.
3. Combine the clues. Use the analogy strategy.

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### Outside-In Strategy

(for more examples, see Baumann et al, 2002; Ebbers & Denton, 2008)

**The coal miners, coughing and wheezing, suffered from pneumonoultramicroscopicsilicovolcanoconiosis.**


---

pneumono ultra microscopic silico volcano coniosis

"I don't know this sickness, but I know pneumonia and I know volcano, so by analogy, this sickness might have something to do with lungs and heat—maybe the lungs are inflamed."

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Students skilled in morphemic and contextual analysis have the potential to increase their vocabulary breadth and depth substantially.



(Edwards, Font, Baumann, & Boland (2004) in Baumann & Kame'enui, p. 161)

**breadth**

Note: Efficacy inconclusive for severe reading disability

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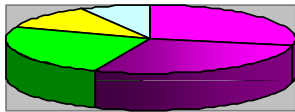
### Word-Savvy Students Understand the English Language

(and realize that most words are not rule-breakers)

**German, Latin, French, and Greek**

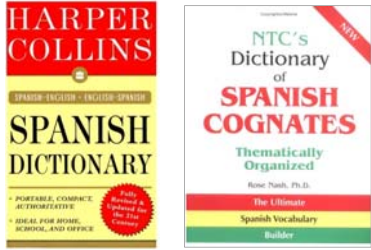
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### The English Language



Estimates from a computerized survey of about 80,000 words in the old *Shorter Oxford Dictionary* (3rd ed.), published in *Ordered Profusion*, Finkenstaedt & Wolff (1973)

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**Teachers and students benefit from resources for accessing the cognate (e.g., Spanish)**

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### Spanish-English Cognates, Pictured

Latin root *rod, ros*: 'to gnaw, to chew'

<i>corrosion</i>	<i>rodent</i>	<i>erosion</i>
		
<i>corrosión</i>	<i>roedor</i>	<i>erosión</i>

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### Common Spanish & Academic English

(Bravo, Hiebert, & Pearson, 2007)

Latin root	Common Spanish	Academic English	Common English
arbor	árbol	arbor, arboretum	tree
avis	ave	avian, aviary, aviation	
primus	primero	prime, primary, primer	
luna	luna	lunar, lunacy, lunatic	
necessitas	necesitar	necessity, necessary	

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### Cognates, Morphology & Academic English

#### An ELL and EO Study in Fifth Grade

"Teaching new words was subordinated to the goal of teaching about words— various kinds of information about words that could help children figure out meanings on their own"

Carlo, August, McLaughlin, Snow, Dressler, et al., 2004, p. 205

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**When students are aware of Spanish-English cognates, they resolve vocabulary tasks more effectively.**

Nagy, Garcia, Durgunoglu, & Hancin-Bhatt, 1993

### Uncover and Discuss False Cognates!

**insect/insecto, observe/observar**

**Most Spanish words that end in *-ción* can be translated into English by changing the suffix to *-tion***

- constitución* means "constitution"
- nación* means "nation"

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### Support for Language Learners

Goldenberg, 2006, Education Week, 25(43)

1. Strategic use of the primary language
2. Predictable, clear, consistent instructions and routines
3. Redundant information (visuals, physical gestures, etc.)
4. Focus on the similarities (i.e. cognates) and differences between English and the native language
5. Identify and clarify difficult words and passages
6. Consolidate text knowledge through summarization
7. Provide extra practice in reading words, sentences, and stories
8. Target vocabulary and check comprehension frequently
9. Paraphrase students' remarks and encourage expansion
10. Build on students' knowledge in their native languages

### What Not To Do

- Memorizing word lists
- Teaching words without context, or usage
- Using dictionaries to teach meanings
  - Instead, use student-friendly definitions
    - Generated by teacher and/or students
    - Some student-friendly dictionaries:
      - Longman Publishing House
      - Collins Cobuild Dictionary

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### Specific Word Instruction

- Cognitively engaging and meaningful
- Student-friendly definition
- Examples and non-examples
- Peer discussions using key vocabulary
- Multiple exposures over time
- Multiple venues: Hear, say, read, write
- Reinforced through graphic organizers
  - Semantic mapping and sorting

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**English language learners benefit from instruction that shows how words can be grouped together in meaningful ways, including synonyms, antonyms, and word family associations.**

(Echevarria, Vogt, & Short, 2004; Gorgnet et al., 2000)

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### Interactive Semantic Sorting

- Use relevant vocabulary
- Sort word cards with a peer
- Defend or justify word placement
- Debate options
- Not a right/wrong proposition

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**kinds**

whole milk  
chocolate milk  
buttermilk  
nonfat milk  
soy milk  
evaporated milk  
condensed milk



milk

*leche*

**description**

wet  
white  
watery  
liquid  
(milky)

**packaging**

carton  
jug  
bottle

**related**

milkshake  
milkweed  
Milky Way  
*Eight Maids a Milking*

**workers**

dairy farmer  
trucker  
packager  
grocery clerk

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**Animals**

stampede  
swoop  
soar  
slither  
swarm  
gallop

movements

**Machines**

blast off  
tow  
explode  
spin  
percolate  
calculate

**Toys/Objects**

bounce  
twirl  
roll  
buzz  
tick  
spin

**Nature**

blow  
rustle  
flutter  
erupt  
tremble  
splash

Lehr, Osborn, & Hiebert. *A Focus on Vocabulary*. PREL, 2004. Product # ES0419

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### Semantic Feature Analysis

Teach "How To" with Known Words

Partners discuss answers and justify responses. Verbalize it!

	mammal	reptile	bird
hare			
asp			
vulture			
coyote			
owl			
chameleon			

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## Warning:

### Graphic Organizers à la Mode!

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### Semantic Feature Analysis

Adolescents with Learning Disability

"Systematic discussion utilizing student background knowledge and text information may be particularly fruitful in terms of generating long-term learning"

(Bos & Anders, 1990, p. 40)

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### Word Relationships

Partners discuss answers and justify responses

	nearly the same	nearly the opposite	belong together	not related
homage-respect				
fealty-loyalty				
serf-lord				
moat-tower				
knight-tapestry				
knight-night				
crusade-crusader				

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### Frayer Model

Frayer, Frederick, & Klausmeier, 1969

- Graphic organizer
- May help the learner process information
- Verbalize it
- Use before, during, and after text reading

Definition	Characteristics
Examples	Non-Examples

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<b>Definition</b> Action verb: to make someone who is sad feel better	<b>Characteristics</b> -friendly -kind -sympathetic
<b>console</b>	
<b>Examples</b> -a hug -a bunch of flowers -a sympathy card	<b>Non-Examples</b> -a kick in the teeth when someone is down -rubbing it in

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*definition*

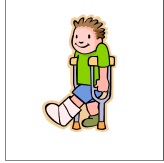
*root*

*target word*

*antonym*

*affixes*

*part of speech*

*sketch*  


*related words*

*cognate*

*sentence*

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*definition*

*root*

*word*

*antonym*

*affixes*

*part of speech*

*sketch*

*related words*

*cognate*

*sentence*


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**Keep Newly Learned Words and Morphemes in Use, with Context**

**Review Revisit Remember**

**Distribute the Practice over Time**

**Vocabulary is a Growth Construct**



Slowly the bucket fills, through many encounters with the word in varying context over time

“Learning things is easy.  
 But remembering them — this is where a certain hopelessness sets in”

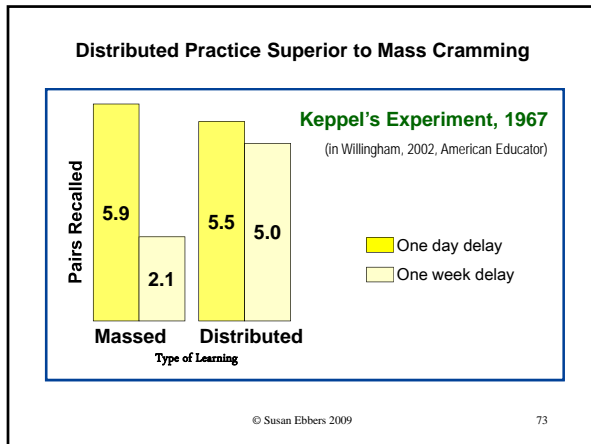
Wolf, 2008

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**“There is a mountain of evidence suggesting that spacing study time leads to better memory of the material”**

Daniel Willingham, 2002

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### To Retain New Vocabulary, Learners Need Multiple Distributed Exposures

- at least 6 exposures
  - Jenkins, Stein, & Wysocki, 1984
- better results with 12 exposures
  - McKeown, Beck, Omanson, & Pople, 1985
- even better with 20 exposures
  - Beck & McKeown (2004)
    - Some of the primary-grade students still did not learn all the new words
- this varies
  - By word and learner characteristics

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- ### Distributed Practice
- Daily teacher-led morphemic/contextual analysis
  - Student notebooks: interesting words, morphemes, word webs, word families, etc.
  - Word walls
  - Flashcards
  - Daily conversation
  - Ongoing context in varied content
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### Word Knowledge Grows

Track Personal Growth Over Time

Useful when introducing and reviewing words

WORDS	No clue	Some idea	Can Explain it
terrain	←	★	★
silt	←	★	★
delta	★	←	★

★ 1<sup>st</sup> self-screening  
★ 2<sup>nd</sup> self-screening

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### Professional Morphology Guides

**Moats, 2000**      **Henry, 2003**      **Moats, 2009**  
**LETRS Module 4**

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### Professional Vocabulary Guides

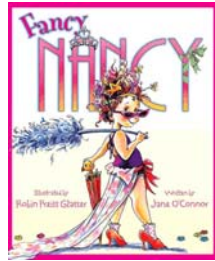
- Bringing Words to Life
  - Beck, McKeown, & Kucan, 2002
- The Vocabulary Book
  - Graves, 2006

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## Awareness of "Plain" and "Fancy" Words

### Fancy Nancy series

- by Jane O'Connor
- learn new words
- develop synonym selectivity, nuance
- grades K-4, depending on how it's used



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## Lemony Snicket Inserts Definitions Into His Narratives

Example: *A Series of Unfortunate Events; The Carnivorous Carnival*

But I always insist that the most frightening part of any beast is its belly, for the simple reason that if you are seeing the belly of the beast it means you have already seen the teeth of the beast and the claws of the beast and even the hair of the beast, and now you are trapped and there is probably no hope for you. For this reason, the phrase "in the belly of the beast" has become an expression which means "inside some terrible place with little chance of escaping safely," and it is not an expression one should look forward to using.

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- Sopris West Publications:
  - Vocabulary Through Morphemes: Suffixes, Prefixes, and Roots for Intermediate Grades
  - Power Readers (consumable interactive decodables with pre-reading and post-reading material)
  - Supercharged Readers: Decodable chapter books with strong vocabulary component
  - Daily Oral Vocabulary Exercises: A Program to Expand Academic Language in Grades 4-12

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